

PATENT  
Atty. Dkt. No. APPM/008284/W-C/W-C/CKIM  
Serial No. 10/678,182

### REMARKS

This is intended as a full and complete response to the Final Office Action dated January 10, 2006, having a shortened statutory period for response set to expire on April 10, 2006. Claims 1-5, 9-14, 16-20, 24-30 and 34-45 remain pending in the application. Claims 1-5, 9-14, 16-20, 24-30 and 34-45 stand rejected by the Examiner. Please reconsider the claims pending in the application for reasons discussed below.

Applicant has amended Claims 1, 5, 14, 20, 29 and 30 and has cancelled Claims 16, 39, 41 and 44 without prejudice in order to place the claims in condition for allowance. Claims 5, 20 and 30 are amended to correct matters of form. Claim 1, 14 and 29 are amended to clarify the invention and include the subject matter as recited in claims 16, 39-42, and 44-45 without introducing new matter. Applicant respectfully submits that the amendments introduce no new matter and are supported by the Specification. In addition, Applicant reserves the right to pursue the subject matter of the original claims 1, 14, 16, 29, 39, 41, and 44 at a later date. Reconsideration of the rejected claims is requested for reasons presented below.

#### Claim Rejections - 35 USC § 112

Claims 14, 16-20, 26-28, 41 and 42 stand rejected under 35 U.S.C. § 112, second paragraph. The Examiner states that Claim 14 recites steps of combining an aqueous solution and exposing the substrate but it is confusing and unclear that after combining hydrogen peroxide with aqueous solution, how the cleaning solution has other chemicals such as sulfuric acid and hydrogen fluoride. Applicant respectfully traverses the rejection.

Applicant has amended claim 14 to correct informalities and include an aqueous solution comprising by weight about 67% of sulfuric acid and about 0.4% of hydrofluoric acid, as recited in dependent claim 42 and the cancelled claim 16, without introducing new matter. Withdrawal of the rejection is respectfully requested.

#### Claim Rejections - 35 USC § 102

PATENT  
Atty. Dkt. No. APPW008284/W-C/M-C/CKIM  
Serial No. 10/676,182

Claims 1-2, 5, 9-12, 14-16, 20, and 24-27 stand rejected under 35 U.S.C. § 102(b) as being anticipated by *Ramachandran et al.* (WO-02/10480). The Examiner states that *Ramachandran et al.* discloses a method of removing residue from a substrate using an etching composition comprising about 0.01 to about 15 percent by weight of sulfuric acid, about 0.01 to about 20 percent by weight of hydrogen peroxide, or about 1 to about 30 ppm of ozone, and about 0.1 to about 100 ppm of hydrofluoric acid and rinsing the substrate with deionized water. Applicant respectfully traverses the rejection.

*Ramachandran* describes a method of forming a cleaning solution by mixing 98 percent by weight of sulfuric acid and 30 percent by weight of hydrogen peroxide in a mixing tank 30 with water into a mixture of sulfuric acid and hydrogen peroxide to their desired percentages, mixing 49 percent by weight of hydrofluoric acid (HF) directly into the mixing tank 30 or adding the hydrofluoric acid into a separate wafer processing tank 33, either before, during or after the mixture of sulfuric acid and hydrogen peroxide is transported to the wafer processing tank 33, and monitoring the concentration of the hydrofluoric acid in the mixing tank 30 or the wafer processing tank 33 through a feedback control loop. (See, Abstract, page 6 paragraph 2, page 7, paragraph 5, page 8, table I-II, paragraph 2, and page 9, paragraph 3). *Ramachandran* does not teach, show or suggest an aqueous solution including about 67% by weight of sulfuric acid and about 0.4% by weight of hydrofluoric acid, as recited in claims 1, 14, and claims dependent thereon. In addition, *Ramachandran* does not teach, show or suggest mixing an aqueous solution including sulfuric acid and hydrofluoric acid with a hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) solution, as recited in claims 1, 14, and claims dependent thereon. Further, *Ramachandran* does not teach, show or suggest forming a cleaning solution by selecting a predetermined weight ratio of an aqueous solution of sulfuric acid and hydrofluoric acid to a hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) solution and mixing the aqueous solution with the hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) solution at a predetermined temperature of about 3°C or less higher than temperatures of the aqueous solution and the hydrogen peroxide solution, as recited in claims 1, 14, and claims dependent thereon.

PATENT  
Atty. Dkt. No. APPM/008284/W-C/W-C/CKIM  
Serial No. 10/676,182

Applicant has amended claims 1, 14, and claims dependent thereon without introducing new matter to include mixing an aqueous solution comprising by weight about 67% of sulfuric acid and about 0.4% of hydrofluoric acid with a hydrogen peroxide solution to produce a cleaning solution, wherein a predetermined weight ratio of the aqueous solution to the hydrogen peroxide solution is selected to form the cleaning solution at a predetermined temperature of about 3°C or less higher than temperatures of the aqueous solution and the hydrogen peroxide solution. As supported by the Specification, Applicant respectfully submits that paragraph [0018] of the instant application states that concentrated sulfuric acid (e.g., 98%) is commonly used as a component in various solutions in fabrication facilities and is very exothermic during the dissociation reaction with water to form diluted sulfuric acid mixtures, and the exothermic reaction produces uncontrollable heat in the mixing vessel, which is an undesirable attribute, since heated solutions may need to cool before they are used. In one aspect of the invention, sulfuric acid with a concentration of 70% or less is used as a sulfuric acid source. In one example, an aqueous solution having about 67% H<sub>2</sub>SO<sub>4</sub> is combined with a hydrogen peroxide solution to cause a small and manageable increase in temperature (<3°C) to the resulting cleaning solution. Accordingly, *Ramachandran* does not teach, show or suggest mixing an aqueous solution of about 67% by weight of sulfuric acid and about 0.4% by weight hydrofluoric acid with a hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) solution and forming a cleaning solution at a predetermined weight ratio of the aqueous solution to the hydrogen peroxide solution and at a predetermined temperature of about 3°C or less higher than temperatures of the aqueous solution and the hydrogen peroxide solution, as recited in claims 1, 14, and claims dependent thereon.

Applicant respectfully submits that *Ramachandran* does not teach, show or suggest mixing an aqueous solution comprising about 67% by weight of sulfuric acid and about 0.4% by weight of hydrofluoric acid with a hydrogen peroxide solution to produce a cleaning solution, wherein a predetermined weight ratio of the aqueous solution to the hydrogen peroxide solution is selected to form the cleaning solution at a predetermined temperature of about 3°C or less higher than temperatures of the aqueous solution and the hydrogen peroxide solution and the cleaning solution

PATENT  
Atty. Dkt. No. APPM/008284/W-C/W-C/CKIM  
Serial No. 10/676,182

comprises hydrogen peroxide at a concentration within a range from about 1% to about 15% by weight, sulfuric acid at a concentration within a range from about 1% to about 10% by weight, and hydrogen fluoride at a concentration within a range from about 10 ppm to about 1,000 ppm, applying an aliquot of the cleaning solution to a substrate surface for a time period, and rinsing the aliquot from the substrate surface with water to form a wash solution, as recited in claim 1 and claims dependent thereon.

Applicant respectfully submits that *Ramanchandran* does not teach, show or suggest combining an aqueous solution comprising about 67% by weight of sulfuric acid and about 0.4% by weight of hydrofluoric acid with a hydrogen peroxide solution at a predetermined weight ratio of about 1 to about 20 to form a cleaning solution at a predetermined temperature of about 3°C or less higher than temperatures of the aqueous solution and the hydrogen peroxide solution, exposing the substrate surface to an aliquot of the cleaning solution, wherein the cleaning solution comprises hydrogen peroxide at a concentration within a range from about 1% to about 15% by weight, sulfuric acid at a concentration within a range from about 1% to about 10% by weight, and hydrogen fluoride at a concentration within a range from about 10 ppm to about 1,000 ppm, and rinsing the substrate surface with water to remove a residue and the aliquot of the cleaning solution, as recited in claim 14 and claims dependent thereon. Withdrawal of the rejection is respectfully requested.

Claims 1-2, 5, 9-12, 14-16, 20, and 24-27 stand rejected under 35U.S.C.102(e) as being anticipated by *Rath et al.* (US Patent No. 6,630,074, hereafter *Rath et al.* '074). The Examiner states that *Rath et al.* '074 discloses a method of removing residue from a substrate using an etching composition comprising about 0.01 to about 15 percent by weight of sulfuric acid, about 0.01 to about 20 percent by weight of hydrogen peroxide, or about 1 to about 30 ppm of ozone, and about 0.1 to about 100 ppm of hydrofluoric acid and rinsing the substrate with deionized water. Applicant respectfully traverses the rejection.

*Rath et al.* '074 discloses a method of forming an etchant composition for cleaning via residue. *Rath et al.* '074 states that the etchant composition can be prepared by admixing an aqueous sulfuric acid such as a 98 percent by weight

PATENT  
Atty. Dkt. No. APPM/008284/W-C/W-C/CKIM  
Serial No. 10/676,182

solution with an aqueous solution of hydrogen peroxide such as a 30 percent by weight solution and aqueous hydrofluoric acid such as 49 percent by weight and adding these solutions to water in an amount to provide the desired percentage of the sulfuric acid, hydrogen peroxide, and hydrofluoric acid. (See, column 4, lines 8-15.) *Rath et al.* '074 does not teach, show or suggest an aqueous solution including about 67% by weight of sulfuric acid and about 0.4% by weight of hydrofluoric acid, as recited in claims 1, 14, and claims dependent thereon. In addition, *Rath et al.* '074 does not teach, show or suggest mixing an aqueous solution including sulfuric acid and hydrofluoric acid with a hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) solution, as recited in claims 1, 14, and claims dependent thereon. Further, *Rath et al.* '074 does not teach, show or suggest forming a cleaning solution by selecting a predetermined weight ratio of an aqueous solution of sulfuric acid and hydrofluoric acid to a hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) solution and mixing the aqueous solution with the hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) solution at a predetermined temperature of about 3°C or less higher than temperatures of the aqueous solution and the hydrogen peroxide solution, as recited in claims 1, 14, and claims dependent thereon.

Applicant has amended claims 1, 14, and claims dependent thereon without introducing new matter to include mixing an aqueous solution comprising by weight about 67% of sulfuric acid and about 0.4% of hydrofluoric acid with a hydrogen peroxide solution to produce a cleaning solution, wherein a predetermined weight ratio of the aqueous solution to the hydrogen peroxide solution is selected to form the cleaning solution at a predetermined temperature of about 3°C or less higher than temperatures of the aqueous solution and the hydrogen peroxide solution. Accordingly, *Rath et al.* '074 does not teach, show or suggest mixing an aqueous solution of about 67% by weight of sulfuric acid and about 0.4% by weight hydrofluoric acid with a hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) solution and forming a cleaning solution at a predetermined weight ratio of the aqueous solution to the hydrogen peroxide solution and at a predetermined temperature of about 3°C or less higher than temperatures of the aqueous solution and the hydrogen peroxide solution, as recited in claims 1, 14, and claims dependent thereon. Withdrawal of the rejection is respectfully requested.

PATENT  
Atty. Dkt. No. APPW008284/W-C/W-C/CKIM  
Serial No. 10/678,182

Claims 1-2, 5, 9-12, 14-16, 20, 24-27, 38 and 43 stand rejected under 35U.S.C. 102(b) as being anticipated by *Rath et al.* (EP-0918081, hereafter *Rath et al.* '081).) The Examiner states that *Rath et al.* '081 discloses a method of removing residue from a substrate using an etching composition comprising about 0.01 to about 15 percent by weight of sulfuric acid, about 0.01 to about 20 percent by weight of hydrogen peroxide, or about 1 to about 30 ppm of ozone, and about 0.1 to about 100 ppm of hydrofluoric acid and rinsing the substrate with deionized water. Applicant respectfully traverses the rejection.

*Rath et al.* '081 discloses a method of forming an etchant composition for cleaning via residue. *Rath et al.* '081 states that the etchant composition can be prepared by admixing an aqueous sulfuric acid such as a 98 percent by weight solution with an aqueous solution of hydrogen peroxide such as a 30 percent by weight solution and aqueous hydrofluoric acid such as 49 percent by weight and adding these solutions to water in an amount to provide the desired percentage of the sulfuric acid, hydrogen peroxide, and hydrofluoric acid. (See, paragraph 0017.) *Rath et al.* '081 does not teach, show or suggest an aqueous solution including about 67% by weight of sulfuric acid and about 0.4% by weight of hydrofluoric acid, as recited in claims 1, 14, 29 and claims dependent thereon. In addition, *Rath et al.* '081 does not teach, show or suggest mixing an aqueous solution including sulfuric acid and hydrofluoric acid with a hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) solution, as recited in claims 1, 14, 29 and claims dependent thereon. Further, *Rath et al.* '081 does not teach, show or suggest forming a cleaning solution by selecting a predetermined weight ratio of an aqueous solution of sulfuric acid and hydrofluoric acid to a hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) solution and mixing the aqueous solution with the hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) solution at a predetermined temperature of about 3°C or less higher than temperatures of the aqueous solution and the hydrogen peroxide solution, as recited in claims 1, 14, 29 and claims dependent thereon.

Applicant has amended claims 1, 14, 29 and claims dependent thereon without introducing new matter to include mixing an aqueous solution comprising by weight about 67% of sulfuric acid and about 0.4% of hydrofluoric acid with a hydrogen peroxide solution to produce a cleaning solution, wherein a predetermined weight ratio

PATENT  
Atty. Dkt. No. APPM/008284/W-C/W-C/CKIM  
Serial No. 10/676,182

of the aqueous solution to the hydrogen peroxide solution is selected to form the cleaning solution at a predetermined temperature of about 3°C or less higher than temperatures of the aqueous solution and the hydrogen peroxide solution. Accordingly, *Rath et al.* '081 does not teach, show or suggest mixing an aqueous solution of about 67% by weight of sulfuric acid and about 0.4% by weight hydrofluoric acid with a hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) solution and forming a cleaning solution at a predetermined weight ratio of the aqueous solution to the hydrogen peroxide solution and at a predetermined temperature of about 3°C or less higher than temperatures of the aqueous solution and the hydrogen peroxide solution, as recited in claims 1, 14, 29 and claims dependent thereon. Withdrawal of the rejection is respectfully requested.

### Claim Rejections - 35 USC § 103

Claims 1-2, 5, 9-10, 14-16, 20, 24-25, 38-39 and 41 stand rejected under 35U.S.C.103(a) as being obvious over *Kuhn-Kuhnenfeld et al.* (US Patent No. 4,100,014). The Examiner states that *Kuhn-Kuhnenfeld et al.* discloses a method of removing a residue from a substrate surface using an etching solution which includes 1 to 30% by weight of hydrofluoric acid, 2 to 30% by weight of hydrogen peroxide, 1 to 75% by weight of sulfuric acid, and 15 to 95 % by weight of water to a total of 100%. The Examiner also states that the etching solution of *Kuhn-Kuhnenfeld et al.* is obtained by mixing commercially-obtainable concentrations of the hydrofluoric acid and hydrogen peroxide, and subsequent slow stirring of concentrated aqueous sulfuric acid of about 98% by weight into the mixture of hydrofluoric acid and hydrogen peroxide. The Examiner further states that an etching solution *Kuhn-Kuhnenfeld et al.* which is stable for a period of several days is prepared by slowly pouring one part by volume of concentrated aqueous sulfuric acid of about 98% by weight into one part by volume of 40% by weight of hydrofluoric acid and four parts by volume of 30% by weight of hydrogen peroxide, where the prepared cleaning solution has to be heated first to about 80° to 100 °C. The Examiner further states that it would have been obvious to manipulate the percentage of the hydrogen fluoride concentration, time for

PATENT  
Atty. Dkt. No. APPW008284/W-C/W-C/CKIM  
Serial No. 10/876,182

treatment and temperature of *Kuhn-Kuhnenfeld et al.* for better and efficient results. Applicant respectfully traverses the rejection.

*Kuhn-Kuhnenfeld et al.* discloses an etching solution for etching group III and group V semiconductor material using high concentrations of etching chemicals, not for cleaning a substrate surface and removing a residue using chemicals at diluted concentrations. *Kuhn-Kuhnenfeld et al.* does not teach, show or suggest a method of removing a residue from a substrate solution using a cleaning solution as recited in claims 1, 14 and claims dependent thereon. In addition, as the Examiner points out, *Kuhn-Kuhnenfeld et al.* discloses mixing three concentrated solutions of hydrofluoric acid, hydrogen peroxide, and sulfuric acid together into an etching solution at their desired final concentrations. *Kuhn-Kuhnenfeld et al.* does not teach, show, suggest or motivate an aqueous solution including about 67% by weight of sulfuric acid and about 0.4% by weight of hydrofluoric acid, as recited in claims 1, 14, and claims dependent thereon. In addition, *Kuhn-Kuhnenfeld et al.* does not teach, show, suggest or motivate mixing an aqueous solution including sulfuric acid and hydrofluoric acid with a hydrogen peroxide ( $H_2O_2$ ) solution, as recited in claims 1, 14, and claims dependent thereon. Further, *Kuhn-Kuhnenfeld et al.* does not teach, show, suggest or motivate forming a cleaning solution by selecting a predetermined weight ratio of an aqueous solution of sulfuric acid and hydrofluoric acid to a hydrogen peroxide ( $H_2O_2$ ) solution and mixing the aqueous solution with the hydrogen peroxide ( $H_2O_2$ ) solution at a predetermined temperature of about 3°C or less higher than temperatures of the aqueous solution and the hydrogen peroxide solution, as recited in claims 1, 14, and claims dependent thereon.

Applicant has amended claims 1, 14 and claims dependent thereon without introducing new matter to include mixing an aqueous solution comprising by weight about 67% of sulfuric acid and about 0.4% of hydrofluoric acid with a hydrogen peroxide solution to produce a cleaning solution, wherein a predetermined weight ratio of the aqueous solution to the hydrogen peroxide solution is selected to form the cleaning solution at a predetermined temperature of about 3°C or less higher than temperatures of the aqueous solution and the hydrogen peroxide solution. Accordingly, *Kuhn-Kuhnenfeld et al.* does not teach, show, suggest or motivate



PATENT  
Atty. Dkt. No. APPM008284/W-C/W-C/CKIM  
Serial No. 10/676,182

mixing an aqueous solution of about 67% by weight of sulfuric acid and about 0.4% by weight hydrofluoric acid with a hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) solution and forming a cleaning solution at a predetermined weight ratio of the aqueous solution to the hydrogen peroxide solution and at a predetermined temperature of about 3°C or less higher than temperatures of the aqueous solution and the hydrogen peroxide solution, as recited in claims 1, 14 and claims dependent thereon. Withdrawal of the rejection is respectfully requested.

Claims 3-4, 17-19, 29-30, 34-35, 37, 40, and 42-45 stand rejected under 35U.S.C.103(a) as being obvious over *Rath et al.* or *Ramachandran et al.* or *Kuhn-Kuhnenfeld et al.* in view of *Gotoh et al.* (US Patent No. 5,650,041) The Examiner states that *Rath et al.* (U.S. patent 6,630,074 or EP-0918081), *Ramachandran et al.* (WO-02/10480) and *Kuhn-Kuhnenfeld et al.* were discussed supra; however, the references fail to use surfactant in the cleaning solution. The Examiner also states that *Gotoh et al.* disclose a method for removing residue from a substrate surface with a cleaning solution comprising hydrofluoric acid and surfactant and it would have been obvious to incorporate a surfactant in the cleaning solution of *Rath et al.*, *Ramachandran et al.* or *Kuhn-Kuhnenfeld et al.* since the surfactants are well known to reduce the surface tension and increase wet ability of the substrate and one of ordinary skill in the art would manipulate the percentage and temperature for mixing the solution for better and efficient results. Applicant respectfully traverses the rejection.

*Rath et al.* (U.S. patent 6,630,074 or EP-0918081), *Ramachandran et al.* (WO-02/10480) and *Kuhn-Kuhnenfeld et al.* have been discussed above.

*Gotoh et al.* discloses a cleaning solution which includes 0.04-.012 weight % of hydrogen fluoride and 500 ppm of a surfactant for removing polymer residue. *Gotoh et al.* does not teach, show or suggest any of the elements lacking in *Rath et al.* (U.S. patent 6,630,074 or EP-0918081), *Ramachandran et al.* (WO-02/10480) and *Kuhn-Kuhnenfeld et al.* as discussed above.

Claims 3-4, 17-19, 30, 34-35, 37, 40, and 42-45 depend on claims 1, 14, and 29. Applicant has amended claims 1, 14, 29 and claims dependent thereon without introducing new matter to include mixing an aqueous solution comprising by weight

PATENT  
Atty. Dkt. No. APPW008284/W-C/W-C/CKIM  
Serial No. 10/676,182

about 67% of sulfuric acid and about 0.4% of hydrofluoric acid with a hydrogen peroxide solution to produce a cleaning solution, wherein a predetermined weight ratio of the aqueous solution to the hydrogen peroxide solution is selected to form the cleaning solution at a predetermined temperature of about 3°C or less higher than temperatures of the aqueous solution and the hydrogen peroxide solution. Accordingly, *Rath et al.* or *Ramachandran et al.* or *Kuhn-Kuhnenfeld et al.* in view of *Gotoh et al.*, alone or in combination, does not teach, show or suggest mixing an aqueous solution of about 67% by weight of sulfuric acid and about 0.4% by weight hydrofluoric acid with a hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) solution and forming a cleaning solution at a predetermined weight ratio of the aqueous solution to the hydrogen peroxide solution and at a predetermined temperature of about 3°C or less higher than temperatures of the aqueous solution and the hydrogen peroxide solution, as recited in claims 1, 14 and 29, and claims dependent thereon. Withdrawal of the rejection is respectfully requested.

Claims 13, 28 and 36 stand rejected under 35U.S.C.103(a) as being obvious over *Rath et al.* or *Ramachandran et al.* in view of *Oonishi et al.* (US Patent No. 6,273,959) The Examiner states that *Rath et al.* (U.S. patent 6, 630,074 or EP-0918081) and *Ramachandran et al.* (WO-02/10480) were discussed supra; however, the references fail to use sonication. The Examiner also states that *Oonishi et al.* discloses megasonic technique may be employed in combination with a method of cleaning semiconductor devices by immersing the semiconductor into a cleaning solution containing 24 wt% sulfuric acid, 5 wt% hydrogen peroxide, 0.02 wt % hydrogen fluoride, 0.075 wt% n-dodecyl-benzenesulfonic acid, and water for 10 minutes and rinsing with water for 7 minutes. The Examiner further states that it would have been obvious to incorporate the step of sonication as disclosed by *Oonishi et al.* into the process of *Rath et al.*, *Ramachandran et al.* or *Kuhn-Kuhnenfeld et al.* to enhance the removal effect with the sonication. Applicant respectfully traverses the rejection.

*Rath et al.* (U.S. patent 6,630,074 or EP-0918081), *Ramachandran et al.* (WO-02/10480) and *Kuhn-Kuhnenfeld et al.* have been discussed above.

PATENT  
Atty. Dkt. No. APPM/008284/W-C/W-C/CKIM  
Serial No. 10/676,182

*Oonishi et al.* discloses a method of cleaning a semiconductor device with a cleaning solution by forming a sulfate ester bonding with foreign particles using compound having sulfonic acid groups, such as n-dodecyl-benzenesulfonic acid, and the cleaning solution which includes 24 wt% sulfuric acid, 5 wt% hydrogen peroxide, 0.02 wt % hydrogen fluoride, 0.075 wt% n-dodecyl-benzenesulfonic acid, and water is directly prepared. *Oonishi et al.* does not teach, show or suggest any of the elements lacking in *Rath et al.* (U.S. patent 6,630,074 or EP-0918081), *Ramachandran et al.* (WO-02/10480) and *Kuhn-Kuhnenfeld et al.* as discussed above.

Claims 13, 28 and 36 depend on claims 1, 14 and 29, respectively. Applicant has amended claims 1, 14, 29 and claims dependent thereon without introducing new matter to include mixing an aqueous solution comprising by weight about 67% of sulfuric acid and about 0.4% of hydrofluoric acid with a hydrogen peroxide solution to produce a cleaning solution, wherein a predetermined weight ratio of the aqueous solution to the hydrogen peroxide solution is selected to form the cleaning solution at a predetermined temperature of about 3°C or less higher than temperatures of the aqueous solution and the hydrogen peroxide solution. Accordingly, *Rath et al.* or *Ramachandran et al.* or *Kuhn-Kuhnenfeld et al.* in view of *Oonishi et al.*, alone or in combination, does not teach, show or suggest mixing an aqueous solution of about 67% by weight of sulfuric acid and about 0.4% by weight hydrofluoric acid with a hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) solution and forming a cleaning solution at a predetermined weight ratio of the aqueous solution to the hydrogen peroxide solution and at a predetermined temperature of about 3°C or less higher than temperatures of the aqueous solution and the hydrogen peroxide solution, as recited in claims 1, 14 and 29, and claims dependent thereon. Withdrawal of the rejection is respectfully requested.

In conclusion, the references cited by the Examiner, alone or in combination, do not teach, show, or suggest the invention as claimed.

PATENT  
Atty. Dkt. No. APPM/008284/W-C/W-C/CKIM  
Serial No. 10/676,182

Having addressed all issues set out in the final office action, the Applicant respectfully submits that the claims are in condition for allowance and respectfully request that the claims be allowed.

Respectfully submitted,



---

Keith M. Tackett  
Registration No. 32,008  
PATTERSON & SHERIDAN, L.L.P.  
3040 Post Oak Blvd. Suite 1500  
Houston, TX 77056  
Telephone: (713) 623-4844  
Facsimile: (713) 623-4846  
Attorney for the Applicant